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Close Relationships and Risk of Frailty: the Hertfordshire Cohort Study

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To the Editor:

Frailty is a syndrome in older people characterized by vulnerability to stressors due to impairments in multiple systems and decline in the ability to maintain homeostasis.^{1,2} There is no accepted model or definition of frailty,¹ but it is generally agreed that its risk factors may be not just biological and genetic, but also psychosocial.³ One potential risk factor is quality of social relationships. Lack of social support and greater exposure to negative social interactions has been linked prospectively with poorer health and disability.⁴⁻⁷ We investigated whether social support and negative interactions were associated with risk of frailty.

Methods

These analyses were based on 482 people from the Hertfordshire Cohort Study. At baseline (mean age 64.8 ± 2.74) they completed the Close Persons Questionnaire which asks about negative aspects of close relationships, confiding/emotional support and practical support in the last year.⁸ Depression and physical function were assessed using the depression subscale of the Hospital Anxiety and Depression Scale and physical function subscale of the SF-36 General Health Survey respectively. Body mass index (BMI) and grip strength were measured, and participants reported on their walking speed. At follow-up (mean 4.4 \pm 0.9 years later), participants were assessed for frailty according to the Fried criteria.² Frailty was defined as the presence of ≥ 3 of: unintentional weight loss ($>10\text{lb}$ in the past year), weakness (maximum grip strength of $\leq 30\text{kg}$ for men and $\leq 20\text{kg}$ for women), self-reported exhaustion (participant felt everything they did was an effort on ≥ 3 days in the past week), slow walking speed (3-metre walk time in the slowest

fifth of the sex-specific distribution) and low physical activity (SF-36 physical functioning score in the bottom fifth of the sex-specific distribution).

The study was approved by Bedfordshire & Hertfordshire Local Research Ethics Committee and West Hertfordshire Local Research Ethics Committee.

Results

11 men (4.5%) and 24 women (10.1%) were frail at follow-up. Table 1 shows odds ratios (95% confidence intervals) for frailty according to thirds of the distribution of scores for negative aspects of close relationships, confiding/emotional support and practical support at baseline.

In men there were no differences in risk of frailty according to levels of negative interactions in close relationships or social support at baseline. In women, risk of frailty increased with level of negative interactions reported at baseline (p for interaction by sex=0.04). Compared to women who were in the bottom third of the distribution for negative interactions, odds ratios for those in the middle and top third of the distribution for negative interactions respectively were 3.49 (1.01, 12.04) and 8.98 (2.51, 32.1), after adjustment for age, marital status, and levels of confiding/emotional and practical support. After further adjustment for social class, physical function, walking speed, grip strength, body mass index and depression at baseline, these odds ratios were 3.53 (0.83, 15.1) and 6.56 (1.35, 32.0) respectively. There were no associations between confiding/emotional or practical support and risk of frailty.

Discussion

Few previous studies have investigated whether aspects of social relationships are linked prospectively with risk of frailty. In the prospective Alameda County Study, people aged 65-102 who had spent longer living in social isolation were more likely to become frail.⁹ We found no association between perceived social support and subsequent frailty, but duration of social isolation assessed using serial measurements, as in the Alameda study, may provide a more accurate indicator of exposure to social support than the single measurement used here.

Our finding of a link between exposure to negative interactions in close relationships and risk of frailty in women provides support for the view that psychosocial factors may predispose an individual to frailty or precipitate its onset.³ The underlying mechanisms are uncertain, but might involve elevated stress hormones, impaired immune functioning or chronic inflammation.¹⁰

Our study has some weaknesses. We lacked baseline information on some of Fried's criteria so we could not exclude participants who were already frail. However, we were able to adjust for baseline BMI, depression, grip strength, walking speed and physical function, and age, marital status, social class and social support, so it seems unlikely that the association we found in women between negative interactions and subsequent frailty arose because frailty affected how women responded to the questionnaire. We had few cases of frailty among men and this may have affected our ability to detect associations. Finally, our participants were relatively young; whether our findings apply to older individuals is uncertain.

Future research needs to replicate these findings and investigate mechanisms whereby negative social interactions are linked with risk of frailty in later life.

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Conflict of interest

The authors have no conflicts of interest.

Table 1: Odds ratios (95% confidence interval) for frailty in men (n=244) and women (n=238) at follow-up according to scores for negative aspects of close relationships and social support at baseline

	Men			Women		
	Odds ratios (95 % CI)			Odds ratios (95 % CI)		
	No of cases/ No at risk	Model 1*	Model 2*	No of cases/ No at risk	Model 1*	Model 2*
Negative aspects of close relationships						
Low	4/117	1.0	1.0	4/110	1.0	1.0
Medium	5/63	2.65 (0.66, 10.6)	2.36 (0.43, 13.0)	9/79	3.49 (1.01, 12.04)	3.53 (0.83, 15.1)
High	2/64	0.90 (0.15, 5.26)	0.36 (0.03, 4.06)	11/49	8.98 (2.51, 32.1)	6.56 (1.35, 32.0)
P for trend†		0.79	0.69		0.001	0.03
Confiding/emotional support						
Low	4/83	1.0	1.0	11/82	1.0	1.0
Medium	4/83	0.55 (0.08, 3.93)	0.64 (0.12, 3.30)	6/87	0.58 (0.19, 1.83)	0.66 (0.70, 2.62)
High	3/78	0.47 (0.06, 3.96)	0.73 (0.12, 4.40)	7/69	0.97 (0.30, 3.16)	1.35 (0.31, 5.94)

P for trend [†]		0.84	0.91		0.72	0.81
Table 1 cont.						
Practical support						
Low	4/100	1.0	1.0	9/108	1.0	1.0
Medium	5/70	1.43 (0.23, 8.99)	2.33 (0.50, 10.9)	8/69	1.46 (0.48, 4.39)	1.88 (0.43, 8.28)
High	2/74	0.28 (0.02, 3.83)	0.66 (0.09, 4.88)	7/61	1.65 (0.49, 5.55)	0.83 (0.16, 4.19)
P for trend [†]		0.58	0.46		0.48	0.82

*Model 1 adjusts for age, marital status, and the other variables in the table. Model 2 adjusts for the variables in model 1 plus social class, physical function, walking speed, BMI, grip strength and possible or probable depression at baseline. [†]P values for trend were calculated using scores for negative aspects of close relationships and social support as continuous variables.